

## FIRST RECORDS OF LEPTOPODIDAE IN WASHINGTON STATE (HEMIPTERA: HETEROPTERA) WITH NOTES ON HABITAT

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*Abstract.*—*Patapius spinosus* (Rossi) was found in several locations in Benton and Whitman Counties, Washington State. Adults were found from late January through late October with mating pairs and immatures being found only in the fall of the year. The bug was associated with cobblestone and basalt that was being used as roadgrade stabilization or in piles of such rock that had been left after construction activities.

*Key Words.*—Insecta, Leptopodidae, Hanford Site, *Patapius spinosus* (Rossi), Washington State.

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Extant leptopodid bugs are primarily Old World in distribution with fossil evidence known from Mexico and Ecuador (Froeschner 1988). The first recording of a leptopodid from the United States was in California (Arbuckle, Colusa County) where a single individual was found during the examination of tree protectors used to trap peach twig borer larvae on almond trees (Usinger 1941). Subsequent to this first finding, the species in question, *Patapius spinosus* (Rossi) has been found in Nevada, and Idaho (Brothers 1979). *Patapius spinosus* is currently known from California, Nevada, and Idaho in the United States, the Canary Islands, Europe, North Africa, and has been introduced into Chile (Froeschner 1988). Both Brothers (1979) and Froeschner (1988) provide excellent illustrations of the bug. Our finding of this species at several widely separated locations in Washington State is a significant extension of its previously known range and may indicate that the species is relatively widespread in the western United States.

*Patapius spinosus* appears to be rather generalized in its habitat selection. Both Usinger (1941) and Brothers (1971) found the species in areas removed from water sources; Brothers (1971) found specimens on the undersides of cobblestone in a mine-tailings dump. The sites from which we obtained specimens are comparable to a mine tailings area except that our sites are located near water (which the tailings site may have been). Our first finding occurred at the Hanford Nuclear Site (Benton County) in southcentral Washington State. The Hanford Site is an area of native shrub-steppe vegetation with semi-arid climatic conditions that include hot and dry summers and cold winters. Annual precipitation is less than 12 cm. Temperatures range from an average of 3° C in Jan to 33° C in July; temperatures of 30° C or above occur an average of 56 days per year (ERDA 1975).

Specimens were found on the undersides of cobblestones that had been deposited along the margins of a built-up gravel road that ran parallel to an alkaline pond (West Lake—46°36.06' N, 119°32.78' W) located at 150 m in elevation. West Lake is the only naturally occurring pond on the Hanford Site. The pond is surrounded by an alkaline crust with no emergent macrovegetation along the shoreline. However, large areas of bullrush (*Scirpus* sp.) as well as various grasses and other vegetation occur in the area surrounding the pond. The size of the pond is a direct function of ground water elevation and fluctuates throughout long and

short term periods depending on climate and seasonal weather conditions. On average, the pond encompasses 4 hectares. The first specimens were discovered while examining the undersides of the cobblestone on 15 Jan 1999. Subsequent to this finding, a more concerted effort was undertaken on 29 Jan during which several hundred rocks were turned and 30 adult specimens located. Again, on 12 Feb, several specimens were found; we continued to find specimens, sporadically, throughout the summer and into early September when the study, at this site, was discontinued. Only material from the first two collecting dates were taken and processed. Additionally, a single specimen was collected in a pitfall trap (14–26 Aug 1998) located in vegetation surrounding West Lake. Although no effort was made at these times to quantify our collections, we noticed that specimens were never found on the section of rock that was in contact with the soil (moist) and that there appeared to be a certain clumping phenomenon to their discovery. Although few rocks harbored specimens, multiple specimens were sometimes discovered under individual rocks. Specimens are deposited in the M. T. James Entomological Collection, Washington State University.

In an examination of the M. T. James Entomological Collection, Washington State University, we located two specimens that had been collected along the Snake River at the McCauley Ranch that was located (area since flooded) between Almota and Penwawa Canyons (Whitman County) on 20 Mar 1971. A descriptive label on these specimens stated that they had been collected under rocks, as had our Hanford Site specimens. We therefore expanded our survey activities to several, apparently likely sites adjacent to the Snake River. These sites were all located in Whitman County, along the Snake River: Wawawai River road, approximately 19 km SW of Pullman ( $46^{\circ}36.91' N$ ,  $117^{\circ}22.51' W$ ); corner of Wawawai Grade road and Wawawai River road, approximately 17 km SW of Pullman ( $46^{\circ}36.05' N$ ,  $117^{\circ}22.65' W$ ); Almota, (Fig. 1) approximately 24 km W of Pullman ( $46^{\circ}42.22' N$ ,  $117^{\circ}27.98' W$ ) and; Boyer Park (Fig. 2) (at Lower Granite Dam) approximately 22 km WSW of Pullman ( $46^{\circ}40.64' N$ ,  $117^{\circ}26.74' W$ ).

On 28 Feb 1999, sampling was conducted at the above-delineated Snake River sites. Records were kept of the number of rocks turned, the number of times leptopodids were found, and in what size "groups." A total of 1610 rocks were turned with 94 leptopodids found. Specimens were found singly and in groups of up to 10 on the underside of a single rock. While no samples were taken during the summer, on 21 Oct 1999 the Snake River sites were again surveyed. At this time, no count of bugs was maintained and only a small number were collected and processed. However, the number of leptopodid adults was high and, indeed, appeared higher than during our winter sampling periods. Additionally, this was the only time that we found mating pairs and immatures. Again, leptopodids were found in small piles of cobblestone and basalt rock that had been used as road-grade support or had been left in small piles (often of several hundred rocks) after completion of road or walking path construction. These latter piles were often scattered and had been overgrown with grasses (Fig. 2). It is interesting to note that not every pile of rock contained the bugs but, when they were found, numerous rocks within the pile harbored them.

Rocks with leptopodids underneath always contained some open space below and were almost never wet. In the few instances where rocks with leptopodids below were wet, all of the surrounding rocks in the pile were also wet. In most



Figure 1. Basalt rock used for roadside grading at Almota (Whitman County).



Figure 2. Pile of basalt rock at Boyer Park (Whitman County).

areas, when wet and dry rocks were adjacent, it appeared that the insects favored the dry rocks. Rocks with leptopodids on them varied extremely in color and arrangement. There was no apparent pattern in size or color of rock and the number of specimens occurring on the underside of the rock. Some piles of rocks were embedded in grasses; others were on bare dirt. In no cases were leptopodids found on the steep piles of basalt rubble adjacent to roadwork or railroads. When the insects were found near railways and road cuts, they were always on the undersides of rocks arranged in a flatter and less congested manner.

It is interesting to speculate on how *P. spinosus* was introduced into Washington. At both Hanford and the Snake River sites, the bugs were found under cobblestone, river rock that is used for stabilization of roadways. In all instances, the rock had been brought to the site from other areas that could not be discerned by us. However, at Hanford, the rock may have come from the adjacent Columbia River (approximately 3 km from West Lake) and, at the Whitman County sites, rock may have come from the adjacent Snake River. It may be that the bugs are associated with cobble habitat and are distributed as this rock is moved and used in construction efforts. Unfortunately, besides our minimal observations, we have no evidence of such movement.

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